Space Weather Forecast

Issued on Wednesday, 13 July 2022 at 13:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1-R2 blackouts, slight chance of R3 blackouts. Chance of G1/Minor Storms Day 1 (13 July). Slight chance of S1 throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with only Common-class flares in the last 24 hours. There are five sunspot regions on the visible disc. Two of these regions are magnetically complex and of the other three, two are relatively large groups. There are numerous large filaments on the Sun. There were no signs of instability in these in the reporting period, however they will need to be monitored for any lift-off, particularly as some of them are now transiting across the western hemisphere. No Earth-directed Coronal Mass Ejections (CME) were observed in available imagery in the last 24 hours.
Solar Wind / Geomagnetic Activity: The solar wind became enhanced in the last 24 hours, most likely under the influence of the high speed stream originating from a coronal hole, reaching 530 km/s at times. The magnetic field strength carried by the solar wind was mostly weak as was the important north-south component. The result of these solar wind measurements was mostly Quiet to Unsettled geomagnetic activity, with a G1 / Minor Storm interval between 12/1200-1500 UTC.
Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a slight chance of strong (X-class) flares.
Solar Wind / Geomagnetic Activity: The solar wind is expected to be mostly elevated on days 1 and 2, under the influence of the HSS originating from CH99/+. However it may be superseded by the late arrival of a CME that left the sun on 09 July, perhaps increasing the solar wind to strong levels. This CME was expected to arrive early on day 1 (13th), so confidence is decreasing rapidly over time. Otherwise, solar winds are expected to ease on days 3 and 4 (15th and 16th).
Overall geomagnetic activity is expected to be Quiet to Unsettled, with a Chance of Active to G1/Minor Storms under any CME effects. Geomagnetic activity then returning to mostly Quiet levels on days 2 to 4 (14th to 16th July).
Energetic Particles / Solar Radiation: The high energy proton flux (greater than 10 MeV) is likely to remain at background levels. There is however a daily Slight Chance of S1 or greater, due to the presence of two relatively large sunspot regions transiting across the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	1	1	1
Strong	G3	No	2	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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